

Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-11. (Cancelled).

Claim 12. (New) A composite comprising:

an optical transmission means embedded within a layer of composite material;

a high-quality optical interface surface provided within the composite material in connection with the optical transmission means, the optical interface surface providing a means for optical connection to the transmission means from outside the composite material; and

a micro-substrate embedded within the composite material on which an optical processing means is provided and secured to the optical transmission means, the optical processing means being optically connected to the optical transmission means for processing light to and from the optical transmission means and for providing the optical interface surface.

Claim 13. (New) The composite according to Claim 12, wherein the micro-substrate is formed from silicon.

Claim 14. (New) The composite according to Claim 12, further comprising a passageway formed within the composite material to the embedded optical transmission means.

Claim 15. (New) The composite according to Claim 14, further comprising means for preventing laser irradiation light used to form the passageway from being optically coupled with the optical transmission means, by differentiating between wavelengths of laser light used to form the passageway and light used in the optical transmission means.

Claim 16. (New) The composite according to Claim 12, further comprising locating means for locating position of the high-quality optical surface from an exterior of the carrier, said locating means comprising a detectable position marker embedded within the composite material.

Claim 17. (New) The composite according to Claim 16, wherein the locating means comprises the micro-substrate.

Claim 18. (New) A composite comprising:

an optical transmission means embedded within a layer of composite material;

a high-quality optical interface surface provided within the carrier in connection with the optical transmission means, the optical interface surface providing a means for optical connection to the transmission means from outside the composite material, via a passageway formed by laser irradiation;

a micro-substrate embedded within the composite material on which an optical processing means is provided and secured to the optical transmission means, the optical processing means being optically connected to the optical transmission means for processing light to and from the optical transmission means and for providing the optical interface surface;

means for preventing laser irradiation light used to form the passageway from being optically coupled with the optical transmission means, by differentiating between wavelengths of laser light used to form the passageway and light used in the optical transmission means;

locating means for locating position of the high-quality optical interface surface from an exterior of the carrier, said locating means comprising a detectable position marker embedded within the composite material; and

a depth marker embedded within the composite material to indicate when the passageway has been formed to a correct depth.

Claim 19. (New) The composite according to Claim 18, wherein the depth marker is provided by the micro-substrate.

Claim 20. (New) The composite according to Claim 12, further comprising:

locating means for locating position of the high-quality optical interface surface from an exterior of the composite material, said locating means comprising a detectable position marker embedded within the composite material; and

a depth marker provided by the micro-substrate;

wherein the depth marker comprises the position marker.

Claim 21. (New) The composite according to Claim 12, further comprising:

a passageway formed within the composite material to the embedded optical transmission means; and

locating means for locating position of the high-quality optical interface surface from an exterior of the composite material, said locating means comprising a detectable position marker embedded within the composite material;

wherein the position marker comprises a sacrificial coating which is arranged to be removable after formation of the passageway to access the optical transmission means.

Claim 22. (New) The composite according to Claim 12, further comprising:

a passageway formed within the composite material to the embedded optical transmission means;

means for preventing laser irradiation light used to form the passageway from being optically coupled with the optical transmission means, by differentiating between wavelengths of laser light used to form the passageway and light used in the optical transmission means;

a depth marker embedded within the composite material to indicate when the passageway has been formed to a correct depth, wherein the depth marker comprises a sacrificial coating which is removable after formation of the passageway to access the optical transmission means.

Claim 23. (New) The composite according to Claim 12, further comprising an alignment structure embedded within the composite material for aligning an interface means with the optical transmission means via the optical interface surface.

Claim 24. (New) The composite according to Claim 23, wherein the alignment structure is provided by the micro-substrate.

Claim 25. (New) A structural component, comprising:

a layer of composite material forming said structural component in a desired configuration;

an optical transmission medium embedded within said layer of composite material;

a high-quality optical interface surface provided within the layer of composite material, said optical interface surface providing a means for optical coupling to the transmission medium from outside the composite material;

a preformed micro-substrate embedded within the layer of composite material; and

an optical processing means secured to said micro-substrate and embedded with it in said layer of composite material, said optical processing means being optically coupled to the transmission medium for processing light to or from the transmission medium, and for providing the optical interface surface.